

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF AIR QUALITY
PERMITS SECTION

PREVENTION OF SIGNIFICANT DETERIORATION
PRE-CONSTRUCTION REVIEW AND PRELIMINARY DETERMINATION

FOR

WILBARA, LLC
NEW HANOVER COUNTY
WILMINGTON, NORTH CAROLINA

THIS REVIEW WAS PERFORMED BY THE
DIVISION OF AIR QUALITY

In Accordance With NC DAQ Regulations For
Prevention of Significant Deterioration of Air Quality
15A NCAC 2D .0530 and 15A NCAC 2Q .0300

August 2008

MAILING LIST

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LIBRARY	Mr. David M. Paynter Library Director New Hanover County Public Library 201 Chestnut Street Wilmington, North Carolina 28401 (910) 798-6300	Preliminary Determination & Application
SOURCE	Mr. F. Reed Dulany, III President Dulany Industries, Inc. 1600 E. Presidents Street P.O. Box 546 Savannah, Georgia 31402	Preliminary Determination
EPA	Ms. Kathleen Forney Air Permits Section U.S. EPA Region IV Sam Nunn Atlanta Federal Building 61 Forsyth Street Atlanta, Georgia 30303-3104 (404) 562-9118	Preliminary Determination & Application
	Preliminary Determination and Public Notice via electronic mail to: forney.kathleen@epa.gov with cc to: worley.gregg@epa.gov	
EPA	Mr. Bob Blaszczyk BACT/LAER Clearinghouse OAQPS, MD-13 RTP, North Carolina 27711	BACT Input Summary Sheet

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Preliminary Determination

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1. FACT SHEET

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- Wilbara, LLC is proposing to construct and operate a Greenfield sulfuric acid manufacturing plant with a maximum production capacity of 575 tons per day (tpd) approximately 6.6 miles northwest of Wilmington, New Hanover County on Highway 421 North (Latitude: 34-18-57, Longitude: 77-59-04.22).
- The proposed sulfuric acid manufacturing plant is a major stationary source of sulfur dioxide (SO₂) and sulfuric acid (H₂SO₄) mist as defined in the Prevention of Significant Deterioration (PSD) program pursuant to 15A NCAC 2D .0530 and 40 CFR 51.166. Wilbara, LLC submitted a PSD permit application to the North Carolina Division of Air Quality (NC DAQ) on March 24, 2008.
- The proposed sulfuric acid manufacturing plant will have potential SO₂ emissions of 241.4 tons per year (tpy) and potential H₂SO₄ emissions of 8.1 tpy.
- BACT for SO₂ is a dual adsorption process with a combination of vanadium and cesium catalyst with a maximum allowable SO₂ emission rate of 2.3 pounds per ton (lb/ton) of acid produced.
- BACT for H₂SO₄ is a vertical tube mist eliminator with a maximum allowable H₂SO₄ emission rate of 0.075 lb/ton of acid produced.
- National Ambient Air Quality Standards (NAAQS) and PSD Class II increments will not be violated as a result of emissions from the proposed project.
- Emissions from the proposed sulfuric acid plant will neither cause adverse impacts to soils and vegetation nor cause significant degradation of visibility.
- Air emissions resulting from the proposed project will not significantly impact on air quality related values (including visibility) in a Class I area.

2. INTRODUCTION

2.1 Purpose of Application

Wilbara, LLC (Wilbara), a subsidiary of Dulany Industries, Inc., is proposing to construct and operate a Greenfield sulfuric acid manufacturing plant with a maximum production capacity of 575 tons per day (tpd). Wilbara is proposing to purchase and install an existing sulfuric acid plant, which was originally fabricated in 1978, at the proposed plant site.

The proposed plant will be adjacent to the existing dimethyl terephthalate (DMT) production facility owned and operated INVISTA, S.a.r.l. and located approximately 6.6 miles northwest of downtown Wilmington on Highway 421 North in New Hanover County, North Carolina. New Hanover County is designated as “attainment” or “unclassifiable” for all New Source Review (NSR)-regulated pollutants.

The proposed sulfuric acid manufacturing plant falls under the Standard Industrial Classification (SIC) code 2819 for purified acid production. As a chemical process plant, the proposed facility also falls under one of the “List of 28” industrial categories for which “major stationary source” is defined as a facility with the potential to emit 100 tpy or more of a regulated pollutant under Prevention of Significant Deterioration (PSD) permitting program.¹

The proposed facility will be a major stationary source with the potential to emit 241.4 tpy of sulfur dioxide (SO₂). In addition, the proposed facility will have the potential to emit 8.1 tpy of sulfuric acid mist (H₂SO₄), which is greater than the significant emission rate of 7 tpy.

Therefore, major source PSD permitting is required for both SO₂ and H₂SO₄ pursuant to North Carolina Administrative Code Title 15A, Sub-Chapter 2D, Section .0530 (15A NCAC 2D .0530).

Dulany Industries, Inc. also owns Southern States Chemical, which operates an existing facility with two sulfuric acid plants located at 2600 Highway 421 North in Wilmington, North Carolina. Dulany Industries, Inc. has indicated that it intends to permanently shut down the two older sulfuric acid plants at Southern States Chemical upon start-up of the proposed Wilbara facility. However, NC DAQ has not considered any environmental benefit from the potential shutdown of the Southern States Chemical facility in reviewing this PSD application, nor does the proposed PSD permit require any emissions reductions from the nearby Southern States Chemical facility.

This application is being processed in accordance with the procedures in 15A NCAC 2D .0530 and 15A NCAC 2Q .0300. **Within 12 months of initial start-up of any emission source at the proposed facility, Wilbara is required to submit an application for a Title V air quality permit in accordance with 15A NCAC 2Q .0500.**

¹ 40 CFR 52.166(b)(1)(i)(a)

2.2 Preliminary Determination

NC DAQ has reviewed Wilbara's PSD application to determine compliance with applicable state and Federal air quality requirements, including the following:

- PSD review requirements including a determination of Best Available Control Technology (BACT), a source impact analysis, an additional impact analysis on soils, vegetation and visibility, and a Class I analysis.
- North Carolina Air Quality Rules pursuant to 15A NCAC 2D and 2Q.

From the review, NC DAQ has made a preliminary determination that the proposed sulfuric acid plant complies with the applicable North Carolina air quality regulations, including the PSD requirements. Therefore, NC DAQ is placing a draft air quality permit for the proposed project in the record for public comment. A preliminary determination of compliance with the PSD requirements was contingent upon the following findings:

- A demonstration that Best Available Control Technology (BACT) is applied to the emission sources that will contribute to an increase in SO₂ and/or H₂SO₄ emissions (the only increase subject to PSD review).
- A demonstration that National Ambient Air Quality Standards (NAAQS) and PSD Class II increments will not be violated as a result of emissions from the proposed project.
- A demonstration that emissions from the proposed project will neither cause adverse impacts to soils and vegetation nor cause degradation of local visibility.
- A demonstration that air emissions resulting from the proposed project will not adversely impact a PSD Class I area.

Section 3 of this Preliminary Determination provides a general discussion of the proposed sulfuric acid manufacturing plant. Section 4 provides information about the location of the facility, including general terrain, ecology, and proximity to Class I areas. Section 5 provides a regulatory analysis of the state and federal air quality regulations that apply to the proposed source. Section 6 presents the BACT analysis and determination. Sections 7 and 8 summarize the Air Impact Analysis and the Additional Impacts Analysis, respectively. A copy of the draft air quality permit is included in Appendix A.

In addition to the regulatory analysis, specific public notice requirements and a 30-day public comment period are required before NC DAQ can take final action on the PSD Application. NC DAQ solicits and encourages participation by the public, industry, and other affected persons impacted. Appendix B contains a copy of the Public Notice for this draft air quality permit.

3. GENERAL INFORMATION

3.1 Company Information

Wilbara is a subsidiary of Dulany Industries, Inc. Dulany Industries, Inc. is also the parent company of Southern States Chemical, LLC, which owns and operates an existing 225 tpd sulfuric acid plant approximately 2.5 miles southeast of the proposed Wilbara facility.

3.2 Process Description

Wilbara is proposing to install and operate a new dual adsorption sulfuric acid plant. The equipment proposed for the new facility is an existing 3/1 dual adsorption sulfuric acid plant that was originally fabricated in 1978.

The proposed sulfuric acid manufacturing process can be broken into three distinct steps:

- 1) Molten, elemental sulfur is oxidized (combusted) in the presence of air to form sulfur dioxide;
- 2) Sulfur dioxide is converted to sulfur trioxide in the presence of a catalyst; and,
- 3) Sulfur trioxide is adsorbed by water (in a sulfuric acid solution) to form additional sulfuric acid.

A process flow diagram for the proposed process is provided in Appendix F of the PSD application provided by Wilbara. The proposed process is described in further detail below.

3.2.1 Oxidation of Elemental Sulfur to Sulfur Dioxide

Molten sulfur will be pumped from an on-site storage tank and injected into a sulfur burner/sulfur furnace. Combustion air will also be blown into the furnace after passing through an air filter, a drying tower that pre-heats the stream and removes excess moisture, and a compressor. Elemental sulfur will oxidize in the furnace to form sulfur dioxide, and will exit the furnace at approximately 1,975 °F. The gas stream, which will be too hot for the subsequent conversion process, will be passed through a waste heat recovery boiler and steam superheater to reduce the temperature to approximately 790 °F.

3.2.2 Conversion to Sulfur Trioxide and the First Adsorbing Tower

Catalytic conversion of sulfur dioxide to sulfur trioxide will proceed in four separate passes, or stages. The conversion process is exothermic; therefore, the gas stream will be cooled by either a waste heat recovery boiler or interpass heat exchanger after each conversion stage.

In the first-stage converter, the sulfur dioxide-rich stream from the waste heat recovery boiler will proceed to the first stage of the converter, where the sulfur dioxide will be partially converted to sulfur trioxide in the presence of vanadium catalyst and excess oxygen. The temperature of the gas stream leaving the first-stage converter will be reduced in a second waste

heat recovery boiler prior to proceeding to the second-stage converter.

In the second-stage converter, the gas stream will undergo further conversion of sulfur dioxide to sulfur trioxide in the presence of vanadium catalyst and excess oxygen. Exhaust from the second-stage converter will be cooled in the “hot” interpass heat exchanger, and then routed to the third-stage converter.² The third-stage converts sulfur dioxide to sulfur trioxide in the presence of cesium-promoted catalyst and excess oxygen.

Gases leaving the third-stage converter will be cooled to approximately 375 °F in the “cold” interpass heat exchanger and an economizer and sent to the first adsorbing tower (the “interpass adsorbing tower”). In the interpass adsorbing tower, sulfur trioxide will be adsorbed by water in a sulfuric acid solution to form sulfuric acid. Acid leaves the interpass adsorbing tower at a concentration of 98.5% sulfuric acid by weight. Unadsorbed gases, including unconverted sulfur dioxide, will exit the interpass adsorbing tower to be reheated in the cold interpass and hot interpass heat exchangers, and will then proceed to the fourth and final conversion stage.

In the fourth-stage converter, sulfur dioxide will be converted to sulfur trioxide in the presence of cesium-promoted catalyst and excess oxygen. Gases leaving the fourth-stage converter will be cooled to approximately 300 °F in a superheater and economizer prior to entering the second and final adsorbing tower.

3.2.3 Final Adsorbing Tower

In the final adsorbing tower, sulfur trioxide in the gas stream will be adsorbed by water in a sulfuric acid solution to form sulfuric acid. Acid leaves the final adsorbing tower at a concentration of 98.5% sulfuric acid by weight. Unadsorbed gases, including unconverted sulfur dioxide and unadsorbed sulfur trioxide (assumed to convert to sulfuric acid mist), will be vented to the atmosphere.

3.3 Emissions Information

In addition to the sulfuric acid manufacturing plant, the facility will include one 6 million Btu per hour, natural gas fired boiler and five (5) sulfuric acid storage tanks, each with a capacity of 29,000 gallons, contributing to facility-wide emissions. Potential emissions from the proposed facility are provided in Table 3.3-1 below:

² The hot interpass heat exchanger will also heat the cold gases returning from the first adsorption tower before entering the third stage of the converter.

Table 3.3-1. Summary of Emissions Increases Associated with the Proposed Greenfield Facility

Emission Source	H₂SO₄ Mist/ PM-10¹ (tpy)	SO₂² (tpy)	NOx³ (tpy)	CO (tpy)	VOC (tpy)
Sulfuric Acid Plant	7.9	241.4	10.3	N/A	N/A
Natural Gas Boiler ⁴	0.2	0.02	2.6	2.2	0.1
Sulfuric Acid Tanks ⁵	0.03	N/A	N/A	N/A	N/A
Total	8.1	241.4	12.9	2.2	0.1

Notes:

- 1) Sulfuric acid mist emissions from the sulfuric acid plant are estimated using the BACT emission limit of 0.075 lb/ton.
- 2) Sulfur dioxide emissions from the sulfuric acid plant are estimated using the BACT emission limit of 2.3 lb/ton.
- 3) Nitrogen oxide emissions from the sulfuric acid plant are estimated assuming a maximum NOx concentration in the stack gas of 15 ppm and a stack flow rate of 20,328 scfm.
- 4) Emissions from the natural gas boiler are estimated using emission factors from AP-42 (5th Edition), Chapter 1.4.
- 5) Emissions from the sulfuric acid tanks are estimated using TANKS 4.0 software.

4. REGIONAL DESCRIPTION

Wilbara is proposing to construct and operate a sulfuric acid manufacturing plant approximately 6.6 miles northwest of downtown Wilmington on Highway 421 North in New Hanover County, North Carolina (Latitude: 34-18-57, Longitude: 77-59-04.22) in a mixed industrial/residential-use area. The proposed plant will be adjacent to the existing DMT production facility owned and operated INVISTA, S.a.r.l. The proposed plant site is within the Cape Fear River Basin, falling immediately west of the Northeast Cape Fear River, and has an elevation of approximately 12 feet above the mean sea level.

Wilmington, North Carolina lies within the tidewater portion of North Carolina's Coastal Plain and is characterized by generally flat topography. The area is often swampy and predominantly consists of soft sediment with little or no underlying rock near the soil surface. The area is in a Humid Subtropical climatic region with moderate temperatures, long summers, and brief winters. Summer weather is dominated by a "Bermuda High" pressure system with calm, virtually cloudless weather conditions. Average air temperatures in Wilmington range between 44.5 °F in January and 80.1 °F in July. Annual precipitation averages 50.24 inches per year.

Air quality with respect to the National Ambient Air Quality Standards (NAAQS) in New Hanover County is classified as follows:

<u>Pollutant</u>	<u>Attainment Status</u>
PM-2.5	Attainment/Unclassifiable
PM-10	Attainment/Unclassifiable
Sulfur Dioxide	Attainment/Unclassifiable
Nitrogen Dioxide	Attainment/Unclassifiable
Carbon Monoxide	Attainment/Unclassifiable
Ozone	Attainment/Unclassifiable

Two Class I areas are located within 300 kilometers (km) of the proposed plant site. Swanquarter National Wildlife Refuge in Hyde County, North Carolina is located approximately 185 km northeast of the site. Cape Romain National Wildlife Refuge near Awendaw, South Carolina is approximately 190 km southwest of the site.

5. REGULATORY ANALYSIS

The following discussion pertains to the Federal and state regulatory requirements that would be applicable to the sulfuric acid manufacturing facility that Wilbara has proposed to construct and operate in Wilmington, North Carolina.

5.1 Prevention of Significant Deterioration (15A NCAC 2D .0530)

Congress established the Prevention of Significant Deterioration (PSD) program as part of the 1977 Clean Air Act Amendments. The PSD program requires pre-construction review prior to obtaining a permit. The basic goal of PSD is to ensure that the air quality in clean (i.e. attainment) areas does not significantly deteriorate while maintaining a margin for future industrial growth. The PSD regulations focus on industrial facilities, both new and modified, that create significant increases in the emission of certain pollutants.

Pursuant to the Federal Register notice on February 23, 1982, North Carolina (NC) has full authority from the EPA to implement the PSD regulations in the State effective May 25, 1982. NC's State Implementation Plan (SIP)-approved PSD regulations have been codified in 15A NCAC 2D .0530, which implement the requirements of 40 CFR 51.166. The Code of Federal Regulations (CFR) are incorporated by reference in 15A NCAC 2D .0530 unless a specific reference states otherwise. The version of the CFR incorporated in 15A NCAC 2D .0530 is that as of November 7, 2003, except those provisions noticed as stayed in 69 FR 40274, and does not include any subsequent amendments or editions to the referenced material. The PSD regulations applicable to this project are the regulations in 15A NCAC 2D .0530 in effect as of the final permit issuance date. The latest revisions to 15A NCAC 2D .0530 became effective on May 1, 2008.

Under PSD requirements, all major new or modified stationary sources of air pollutants as defined in Section 169 of the Federal Clean Air Act (CAA) must be reviewed and permitted prior to construction by EPA or permitting authority, as applicable, in accordance with Section 165 of CAA. A "major stationary source" is defined as any one of 28 named source categories, which emits or has a potential to emit 100 tons per year of any regulated pollutant, or any other stationary source, which emits or has the potential to emit 250 tons per year of any PSD regulated pollutant.

The purified acid production industry (SIC Code 2819) is a chemical processing plant, which is one of the 28 named source categories. The proposed sulfuric acid manufacturing facility has the potential to emit greater than 100 tpy of SO₂, and is therefore a PSD major stationary source as defined in 40 CFR 51.166(b)(1)(i)(a). In addition, the proposed facility has the potential to emit greater than 7 tpy of sulfuric acid mist (H₂SO₄), which is the significant emission rate pursuant to 40 CFR 51.166(b)(23)(i). Therefore, major source PSD permitting is required for both SO₂ and H₂SO₄ pursuant to 15A NCAC 2D .0530.

In accordance with the PSD requirements for major source permitting pursuant to 15A NCAC 2D .0530 and 40 CFR 51.166, Wilbara performed the following reviews and analyses for SO₂ and H₂SO₄ mist emissions associated with the project:

- Best Available Control Technology (BACT) determination (See Section 5.0 of application);
- Air Quality Impact Analysis including air dispersion modeling to determine the extent and significance of any potential air quality impact (See Section 6.0 of application); and,
- Additional Impacts Analysis including effects on soils, vegetation, and visibility (See Section 7.0 of application).

5.2 Title V Permitting (15A NCAC 2Q .0500)

The proposed sulfuric acid manufacturing plant will have potential SO₂ emissions of greater than 100 tpy, and therefore will be a major source under the Title V operating permit program pursuant to 15A NCAC 2Q .0500 and 40 CFR Part 70. Wilbara has chosen to obtain a construction and operating permit prior to obtaining a Title V air quality permit in accordance with the procedures in 15A NCAC 2Q .0501(c)(2) and 15A NCAC 2Q .0504. This application is being processed in accordance with the procedures in 15A NCAC 2D .0530 and 15A NCAC 2Q .0300. **Within 12 months of initial start-up of any emission source at the proposed facility, Wilbara is required to submit an application for a Title V air quality permit.**

5.3 Emissions From Plants Producing Sulfuric Acid (15A NCAC 2D .0517)

This regulation limits SO₂ emissions from sulfuric acid manufacturing plants to no greater than 27 lb/ton of acid produced and H₂SO₄ emissions to no greater than 0.5 lb/ton of acid produced. The rule does not identify testing, monitoring, recordkeeping, or reporting requirements associated with the applicable standard. The proposed permit references the testing, monitoring, recordkeeping, or reporting requirements associated with the BACT emission limitations pursuant to 15A NCAC 2D .0530 (See Section 6 of this Preliminary Determination), which are more stringent than the standards pursuant to 15A NCAC 2D .0517.

5.4 Control of Nitrogen Dioxide and Nitrogen Oxides (15A NCAC 2D .0519)

This regulation limits nitrogen oxide (NO_x) emissions from sulfuric acid manufacturing plants to less than 5.8 lb/ton of acid produced. The rule does not identify testing, monitoring, recordkeeping, or reporting requirements associated with the applicable standard. To demonstrate compliance with the standard, the proposed permit includes an initial stack testing requirement.

In addition to demonstrating compliance with the NO_x standard pursuant to 15A NCAC 2D .0519, the testing condition includes a requirement for Wilbara to submit a permit application to address PSD applicability if NO_x emission rates are shown to exceed 0.356 lb/ton of acid

produced. As shown in the following analysis, NOx emission rates in exceedance of 0.356 lb/ton of acid produced would result in facility-wide potential NOx emissions of greater than 40 tpy.

- **Maximum Annual NOx Emissions from the Sulfuric Acid Manufacturing Plant (ID No. ES-01) Prior to Triggering Major Source PSD Review:**

<i>PSD Significant Emission Rate for NOx</i>	<i>40 tpy</i>
<i>Less Potential NOx Emissions From Boiler (ID No. I-B-01)</i>	<i>-2.63 tpy</i>
<i>Maximum Emissions from Acid Plant (ID No. ES-01)</i>	<i>37.37 tpy</i>

- **Maximum NOx Emission Rate from the Sulfuric Acid Manufacturing Plant (ID No. ES-01) Prior to Triggering Major Source PSD Review:**

$$\frac{37.37 \text{ ton.NOx}}{\text{yr}} * \frac{\text{yr}}{365 \text{ day}} * \frac{\text{day}}{575 \text{ ton.acid}} * \frac{2,000 \text{ lb.NOx}}{\text{ton.NOx}} = 0.356 \frac{\text{lb.NOx}}{\text{ton.acid}}$$

If required, and notwithstanding potential compliance and enforcement issues, Wilbara may address PSD applicability by either accepting an enforceable PSD avoidance condition in accordance with 15A NCAC 2Q .0317 or submitting a full PSD application in accordance with 15A NCAC 2D .0530.

5.5 NSPS for Sulfuric Acid Plants; 40 CFR 60, Subpart H (15A NCAC 2D .0524)

The proposed sulfuric acid plant will be affected by this New Source Performance Standard. This rule limits emissions from the plant, as follows:

- SO₂ emissions ≤ 4.0 lbs/ton of 100 percent sulfuric acid produced;*
- H₂SO₄ mist emissions ≤ 0.15 lbs/ton of 100 percent sulfuric acid produced;* and,
- Visible emissions are limited to less than or equal to 10 percent opacity.

* Both SO₂ and H₂SO₄ mist emissions are limited to more stringent BACT limits. See Section 6 of this Preliminary Determination for a discussion of BACT.

Initial compliance testing is required for each standard in addition to the determination of the relative accuracy of the production system to determine production rate.

Continuous monitoring is required for sulfur dioxide emissions. To improve permit clarity, the continuous monitoring requirements pursuant to the NSPS standard are provided in the PSD/BACT portion of the proposed permit. The NSPS portion of the proposed permit simply references the PSD/BACT monitoring requirements, which are more stringent.

The NSPS does not provide any monitoring, recordkeeping, or reporting requirements to demonstrate on-going compliance with the visible emissions standard following the initial performance test. Therefore, NC DAQ has added a requirement to conduct a monthly visible emission observation of the sulfuric acid plant emission point and added associated recordkeeping and reporting requirements.

5.6 Compliance Assurance Monitoring (CAM) (15A NCAC 2D .0614)

To be affected by the Continuous Assurance Monitoring (CAM) requirements pursuant to 15A NCAC 2D .0614, an emissions unit must meet the three criteria provided in 40 CFR 64.2(a), as follows:

- The unit must be subject to an emission limitation or standard for the applicable regulated air pollutants;
- The unit must use a control device to achieve compliance with any such emission limitation or standard; and,
- The unit must have potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

The proposed sulfuric acid manufacturing facility will be equipped with a vertical tube mist eliminator to control H₂SO₄, which is emitted as a particulate. The mist eliminator is required to comply with the NSPS standard of 0.15 lb H₂SO₄ per ton of acid produced and the BACT emission limit of 0.075 lb H₂SO₄ per ton of acid produced. Uncontrolled H₂SO₄ emissions are estimated to be 2.2 lb H₂SO₄ per ton of acid produced. At a maximum production rate of 575 tpd, potential pre-control device H₂SO₄ emissions from the facility are greater than 100 tpy, as shown in the following calculation:

$$\frac{575 \text{ ton.acid}}{\text{day}} * \frac{2.2 \text{ lb.H}_2\text{SO}_4}{\text{ton.acid}} * \frac{365 \text{ day}}{\text{year}} * \frac{\text{ton.H}_2\text{SO}_4}{2,000 \text{ lb.H}_2\text{SO}_4} = 231 \text{ ton.H}_2\text{SO}_4 / \text{year}$$

Therefore, the mist eliminator will be subject to the CAM requirements pursuant to 15A NCAC 2D .0614. Wilbara shall address submit a CAM plan with the initial Title V permit application, which is due within 12 month of initial startup of the facility.

5.7 Control of Toxic Air Pollutants (15A NCAC 2D .1100)

North Carolina has state-enforceable toxic air pollutant (TAP) standards that limit ambient impacts of regulated TAPs. Pursuant to the rule, if facility-wide emissions of a regulated TAP exceed the associated Toxic Permitting Emissions Rate (TPER) provided in 15A NCAC 2Q .0711, the facility must demonstrate that the ambient impact of the affected pollutant does not exceed the Acceptable Ambient Level (AAL) pursuant to 15A NCAC 2D .1100 using air dispersion modeling. The proposed sulfuric acid plant will emit sulfuric acid (H₂SO₄) mist at rates in exceedance of the TPER. Therefore, Wilbara submitted an air dispersion modeling analysis to demonstrate that ambient impacts of sulfuric acid mist resulting from the proposed sulfuric acid plant are below the AAL. A summary of the air toxics compliance demonstration is provided in Section 7.4 of this Preliminary Determination.

5.8 Non-Applicable Regulations

5.8.1 Non-Attainment New Source Review (15A NCAC 2D .0531)

New Hanover County is designated as “attainment” or “unclassifiable” for all New Source Review (NSR)-regulated pollutants. Therefore, NA-NSR permitting requirements pursuant to 15A NCAC 2D .0531 do not apply.

6. BEST AVAILABLE CONTROL TECHNOLOGY

6.1 Introduction

For each pollutant subject to a PSD review, the Permittee must determine and apply the Best Available Control Technology (BACT). BACT is defined, in pertinent part, at 40 CFR 51.166(b)(12) as:

An emissions limitation . . . based on the maximum degree of reduction for each pollutant . . . which would be emitted from any proposed major stationary source or major modification which the reviewing authority, on a case-by-case basis, taking into account energy, environment, and economic impacts and other costs, determines is achievable . . . for control of such a pollutant.

The BACT requirements are intended to ensure that the control systems incorporated in the design of the proposed Greenfield facility reflect the latest demonstrated control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the facility. Given the variation between emission sources, facility configuration, local airsheds, and other case-by-case considerations, Congress determined that it was impossible to establish a single BACT determination for a particular pollutant or source. Economics, energy, and environmental impact are mandated in the CAA to be considered in the determination of case-by-case BACT for specific emission sources. In most instances, BACT may be defined through an emission limitation. In cases where this is impossible, BACT can be defined by the use of a particular type of control device and its achievable emission reduction efficiency. In no event can a technology be recommended which would not comply with any applicable standard of performance under NSPS (40 CFR Part 60) and NESHAPS (40 CFR Part 61).

To assist in bringing consistency to the BACT process, U.S. EPA developed guidance for PSD applicants to use the "top-down" approach to BACT. However, NC DAQ does not strictly adhere to EPA's top-down guidance. Rather NC DAQ implements BACT in strict accordance with the statutory and regulatory language. As such, NC DAQ's BACT conclusions may differ from those of the applicant or U.S. EPA.

6.2 Sulfuric Acid (H₂SO₄) Mist

The applicant's review of the RACT/BACT/LAER Clearinghouse (RBLC) identified eleven H₂SO₄ mist BACT determinations for similar sulfuric acid production operations from the past ten years. BACT emission limitations varied between 0.10-0.15 lb H₂SO₄/ton of sulfuric acid produced. Control technologies were predominated by mist eliminators. In addition, one electrostatic precipitator was chosen with an associated emission limit of 0.15 lb H₂SO₄/ton of sulfuric acid produced.

From the RBLC review and various other sources, the applicant identified the following H₂SO₄ mist emission control options:

- Vertical Tube Mist Eliminator (0.075 lb/ton acid produced)
- Vertical Tube Mist Eliminator (0.10 lb/ton acid produced)
- Wet Electrostatic Precipitator (0.10-0.15 lb/ton acid produced)
- Brinks-Type Vertical Tube Mist Eliminator (0.15 lb/ton acid produced)*
- Mesh Pad Mist Eliminator (>0.15 lb/ton acid produced)
- Vane-Type Mist Eliminator (>0.15 lb/ton acid produced)

* The existing, mothballed sulfuric acid plant proposed for this project, which was originally constructed in 1979, is equipped with a Brinks-Type Vertical Tube Mist Eliminator.

Vertical tube mist eliminators consist of a series of vertically-oriented tubular fiber elements installed in parallel at the top of the adsorber. Vertical tube mist eliminators can be designed to achieve H₂SO₄ emission rates between 0.075 lb/ton of acid produced and 0.100 lb/ton of acid produced. Capital costs associated with the lower-emitting vertical tube mist eliminator (i.e., 0.075 lb/ton of acid produced) are estimated based on the cost to retrofit the sulfuric acid plant proposed for this project, which was originally constructed in 1979 with a Brinks-Type Vertical Tube Mist Eliminator, to accommodate the new control device. Retrofit costs include re-engineering, construction, and installation modifications to reconfigure the adsorber column.

In the PSD application, Wilbara estimated the annual cost of the vertical tube mist eliminator, including capital recovery, to be \$165,371/yr. Annual emissions reductions would total 223 tons of H₂SO₄ mist per year, resulting in an average cost effectiveness of \$741.60/ton.³

Based on the average cost effectiveness of the most effective emission control device, NC DAQ has determined BACT to be use of a vertical tube mist eliminator with an associated H₂SO₄ mist emission rate of 0.075 lb/ton of acid produced on a 3-hour averaging period.

It should be noted that the incremental cost of the lower-emitting vertical tube mist eliminator over the second-ranking control device, the higher-emitting vertical tube mist eliminator, is \$37,972/ton. However, based on the low average cost effectiveness of the lower-emitting vertical tube mist eliminator, the high incremental cost does not justify eliminating the more effective control device from consideration.

The proposed PSD permit includes initial performance testing and annual stack testing to demonstrate compliance with the proposed BACT emission limitation. The 3-hour averaging period is consistent with the averaging period established in the applicable NSPS (See Section 5.5).

³ Calculation: $(2.2 \text{ lb/ton} - 0.075 \text{ lb/ton}) * 575 \text{ ton/day} * 365 \text{ day/yr} * \text{ton}/2,000 \text{ lb} = 223.0 \text{ ton/yr}$

6.3 Sulfur Dioxide (SO₂)

The applicant's review of the RBLC identified seventeen SO₂ BACT determinations for similar, double adsorption-type sulfuric acid production operations from the past ten years. BACT emission limitations varied between 1.0 and 4.0 lb SO₂/ton of sulfuric acid produced. SO₂ emissions from double adsorption-type sulfuric acid plants are dependent upon the efficiency of the conversion from sulfur dioxide to sulfur trioxide, which is in turn dependent upon the catalytic converter, type and quantity of catalyst used, temperature and pressure of the operation, and concentration of sulfur dioxide and oxygen in the feed streams. Wilbara evaluated three process scenarios to limit SO₂ emissions, as follows:

- **Cesium-promoted catalyst in the 3rd/4th converter passes (~2.0 lb/ton acid produced)***
In conversations with Ms. Fern Paterson (NC DAQ), a representative from MECS, Inc. indicated that, while an SO₂ emission rate of 2.0 lb/ton may be achievable using cesium-promoted catalyst in the 3rd and 4th converter passes, MECS, Inc. will not guarantee this emission rate for the proposed sulfuric acid plant.
- **Cesium-promoted catalyst in 4th converter passes (2.5 lb/ton acid produced)****
In conversations with Ms. Paterson, a representative from MECS, Inc. indicated that MECS, Inc. will guarantee an SO₂ emission rate of 2.5 lb/ton is achievable using cesium-promoted catalyst in the 4th converter pass.
- **Vanadium catalyst in all four converter passes (3.5 lb/ton acid produced) – Base Case**

Wilbara also made inquiries with MECS, Inc., a sulfuric acid plant process, technology, and catalyst vendor, about the benefits of utilizing cesium-promoted catalyst in all four passes. According to the vendor, there is a significant reduction of SO₂ emissions when cesium catalyst is used in the 4th pass alone, and then a smaller additional SO₂ reduction when cesium catalyst is also used in the 3rd pass. However, MECS, Inc. indicates that there is no appreciable reduction in SO₂ emissions when cesium catalyst is used in the 1st and 2nd passes. Therefore, the use of cesium catalyst in all four passes was not evaluated further in this application.

Capital costs associated with using the cesium-promoted catalyst in the 3rd and 4th passes includes the cost to retrofit the sulfuric acid plant proposed for this project, which was originally constructed in 1979 to use vanadium catalyst in all four converter passes. Required retrofits include reconfiguring the existing converter to hold a larger quantity of catalyst in the last two passes (~22,000 liters). In addition, the pressure drop across the column is expected to increase by about 6.5 inches of water, requiring approximately 32 brake horsepower of additional motor power.

The average cost of using cesium-promoted catalyst in the 3rd and 4th passes to control SO₂ emissions is estimated to be \$290/ton. As shown in Table 6.3-1, the cost of control was evaluated as the marginal cost increase compared to the "base case", or the use of conventional vanadium catalyst in the dual adsorption process.

Table 6.3-1. Cost Analysis of Cesium-Promoted Catalyst vs. Vanadium Catalyst

	Base Case	Controlled Case	Cost of Control
	Vanadium Catalyst (3.5 lb/ton)	Cesium Catalyst (2.0 lb/ton)	Controlled Case MINUS Base Case
Total Capital Cost			
<i>Cost of Retrofit¹</i>	\$1,800,000	\$1,800,000	\$0
<i>Additional Cost of Cesium Catalyst</i>	N/A	\$121,000	\$121,000
<i>Sales Tax (9%)</i>	\$162,000	\$172,890	\$10,890
Direct Annual Cost			
Additional Cost of Energy with Cesium Catalyst	N/A	\$14,927/yr	\$14,927/yr
Maintenance Labor	\$7,130/yr	\$7,130/yr	\$0/yr
Maintenance Parts	\$7,130/yr	\$7,130/yr	\$0/yr
Indirect Annual Cost			
Property Taxes (1% of Total Capital Cost)	\$19,620/yr	\$20,939/yr	\$1,319/yr
Insurance (1% of Total Capital Cost)	\$19,620/yr	\$20,939/yr	\$1,319/yr
Capital Recovery (19% of Total Capital Cost)	\$372,780/yr	\$397,839/yr	\$25,059/yr
Total Annual Cost			
Direct + Indirect Annual Cost	\$426,280/yr	\$468,904/yr	\$42,624/yr
Cost Benefit from Improved Acid Recovery	N/A	\$6,086/yr	(\$6,086/yr)
Adjusted Annual Cost	\$426,280/yr	\$462,818/yr	\$36,538/yr
SO₂ Emissions²	367 tons/yr	210 tons/yr	126 tons/yr
Cost Efficiency	N/A	N/A	\$289.98/ton

¹ The Applicant indicated that retrofits will be required for the sulfuric acid plant, regardless of whether the plant uses the vanadium catalyst or cesium-promoted catalyst in the final two passes. Therefore, no additional cost would be incurred from retrofitting the facility to accommodate the cesium-promoted catalyst.

² SO₂ emissions for the controlled case are based on an SO₂ emission rate of 2.3 lb/ton of acid produced (vs. 2.0 lb/ton of acid produced). See below for further discussion of the BACT emission limit.

Based on the average cost effectiveness of the most effective emission control scenario, NC DAQ has determined BACT to be the use of cesium-promoted catalyst in the 3rd and 4th converter passes.

MECS, Inc. has indicated that it will guarantee an SO₂ emission rate of 2.5 lb/ton if the proposed sulfuric acid plant is retrofit to use cesium catalyst in the 4th pass only, and that additional emission reductions, resulting in SO₂ emission rates as low as 2.0 lb/ton, are achievable when cesium catalyst is also used in the 3rd pass. However, MECS, Inc. will not guarantee this lower emission rate. While it is clear to NC DAQ that using cesium catalyst in the 3rd converter pass will result in some SO₂ emissions reductions at a reasonable cost, NC DAQ does not believe it is appropriate to set a BACT limit at a level that the engineering company is not willing to guarantee. **Therefore, NC DAQ is setting the SO₂ BACT emission limit at 2.3 lb/ton of acid produced.**

In addition to reviewing catalysts, Wilbara reviewed the technical feasibility of several add-on control devices, as follows:

- **Ozone Scrubbing:** An E.I. DuPont De Nemours & Co. facility located in Union County, New Jersey utilizes a LOTOX[®] Ozone Scrubber. The device is used primarily to control NO_x emissions from the operation. Ozone scrubbers have not been demonstrated to be technically feasible to control SO₂ emissions and are not evaluated further in this application.
- **Sodium Sulfite/Bisulfite Scrubbing:** Wilbara identified two facilities that have installed sodium sulfite/bisulfite scrubbing systems since 1971: The Badger Army Ammunition Plant in Baraboo, Wisconsin and a Rohm and Haas facility in Deer Park, Texas. In each case, the facility discontinued use of the control system as a result of operational difficulties. This control has not been demonstrated to be technically feasible to control SO₂ emissions and is not evaluated further in this application.
- **Molecular Sieves:** Wilbara identified one facility that installed a molecular sieve to control SO₂ emissions since 1971. However, the facility had extensive operational difficulties and retrofitted the plant with a dual adsorption system in 1979. This control has not been demonstrated to be technically feasible to control SO₂ emissions and is not evaluated further in this application.
- **Ammonia Scrubbing:** This control system utilizes anhydrous ammonia and water to scrub SO₂ emissions from the exhaust stream, forming ammonium sulfate. This process is used at sulfuric acid plants located within fertilizer manufacturing facilities, in which the ammonium sulfate may be recycled back to the process and used in the production of fertilizer grade ammonium sulfate. Wilbara did not identify any sulfuric acid plants without associated fertilizer manufacturing operations utilizing ammonia scrubbing to control SO₂ emissions. This control is not evaluated further in this application.

The proposed PSD permit includes initial performance testing and continuous emission monitoring that is consistent with the NSPS monitoring requirements to demonstrate compliance with the proposed BACT emission limitation.

7. AIR QUALITY IMPACT ANALYSIS

PSD regulations [40 CFR 51.166(k)] require an applicant to perform an ambient impact analysis to determine if the Class II Area National Ambient Air Quality Standards (NAAQS), Class II Area increment, and Class I Area increment standards will be exceeded at any location and during any time period where the proposed modification will have significant impact.

In addition, North Carolina has state-enforceable toxic air pollutant (TAP) standards that limit ambient impacts of regulated TAPs. Pursuant to the rule, if facility-wide emissions of a regulated TAP exceed the associated *de minimus* TAP Permitting Emissions Rate (TPER) provided in 15A NCAC 2Q .0711, the facility must demonstrate that the ambient impact of the affected pollutant does not exceed the Acceptable Ambient Level (AAL) pursuant to 15A NCAC 2D .1100 using air dispersion modeling.

This modeling analysis review addresses the ambient impacts of SO₂, a PSD-regulated pollutant, and H₂SO₄ mist, which is both a PSD-regulated pollutant and a state-regulated TAP. The modeling analysis demonstrates that the proposed sulfuric acid plant will not cause or contribute to an exceedence of the Class II NAAQS and PSD Increment, Class I Increment, or NC air toxic AAL.

The location of the proposed sulfuric acid plant is near the Atlantic coast with predominantly flat terrain, and the surrounding area is dominated by agricultural and industrial land-use and forestland. For modeling purposes, the area is classified as rural based on the land-use type scheme established by Auer 1978. The air quality analyses (except for the Class I analysis) were conducted using the EPA AERMOD model and five year (1988-1992) of National Weather Service (NWS) surface (Wilmington, NC) and upper air (Charleston, SC) meteorological data. Full terrain evaluations were included, as were normal regulatory defaults.

7.1 Class II Area Preliminary Impact Analysis (SO₂ and H₂SO₄ Mist)

A preliminary impact air quality analysis was conducted to determine the ambient impacts of the proposed sulfuric acid plant for both SO₂ and H₂SO₄ mist. The modeled impact rates were then compared to the associated Class II Significant Impact Levels (SILs). As shown in Table 7.1-1, the modeled impacts exceeded both the annual and 24-hour SILs for SO₂. Therefore, a full PSD air quality impact analysis is required for this pollutant.

Table 7.1-1. Class II Area Preliminary Impact Analysis (SILs)

Pollutant	Averaging Period	Maximum Modeled Impacts¹ (µg/m³)	Class II Area SILs (µg/m³)
SO₂	Annual	1.4	1
	24-hour	10.8	5
	3-hour	20.8	25
H₂SO₄ mist²	Annual	0.05	1
	24-hour	0.4	5

¹ High First-High (HH) modeled impact.

² Modeled as PM-10.

Sufficient receptor grids were used in the preliminary air quality analysis, beginning at the fenceline, to establish maximum impacts. The Significant Impact Area established by the preliminary impact analysis has a maximum radius of 2.4 kilometers.

7.2 Full Class II Area Impact Analysis (SO₂)

Wilbara conducted a full Class II Area NAAQS and PSD Increment Air Quality Analysis for SO₂, including SO₂ emissions from the proposed sulfuric acid plant, small natural gas-fired boiler (6 mmBtu/hr), and appropriate off-site emission sources and background concentrations for the NAAQS analysis. The model used an appropriate array of receptors beginning at the declared fenceline and extending out 2.5 km. SO₂ background concentrations were taken from the SO₂ monitoring station located in Wilmington, New Hanover County, North Carolina.

Wilbara identified appropriate off-site emission sources to include in the PSD increment and NAAQS modeling using source inventories obtained from NC DAQ. Off-site emission sources identified in the source inventories were included or excluded from the full air quality analyses in accordance with the following criteria:

- Include sources within the Significant Impact Area established in the preliminary impact analysis (i.e., 2.4 kilometers);
- Exclude sources emitting less than 100 tpy SO₂ that are not within the Significant Impact Area;
- Exclude sources located greater than 50 km from the Significant Impact Area.⁴
- For sources emitting at least 100 tpy SO₂ and located within 50 km of the Significant Impact Area:
 - Include sources within 10 km of the proposed plant;
 - Exclude sources if the distance from the proposed plant exceeds the “critical distance”⁵; and,
 - Include sources if the distance from the proposed plant is equal to or less than the “critical distance”.

⁴ NC DAQ may require that sources greater than 50 km from the Significant Impact Area be included in the full air quality analysis if the source is thought to have a significant impact on the modeled source’s impact area. NC DAQ did not require any such source to be included in this analysis.

⁵ “Critical Distance” (D), in km, is calculated as $D = Q/20$, where Q is the maximum emission rate, in tpy, of the off-site source.

Using these criteria, Wilbara identified 114 off-site sources that were included in the NAAQS analysis. Of these sources, 54 were also identified as “increment consuming” sources, and were included in the PSD Increment analysis.

Table 7.2-1 and Table 7.2-2 summarize the modeled ambient impacts for NAAQS and PSD Increment analyses. As shown in the tables, the analyses show that the proposed sulfuric acid plant does not cause or contribute to an exceedance of either the SO₂ NAAQS or PSD Increment.

Table 7.2-1. Class II Area NAAQS Modeling Results

Pollutant	Averaging Period	Maximum Modeled Impacts ¹ (µg/m ³)	Background Concentration (µg/m ³)	Total Impact (µg/m ³)	NAAQS (µg/m ³)	% of NAAQS
SO ₂	Annual	21.5	13	34.5	80	43
	24-hour	193.7	79	272.7	365	75
	3-hour	353.5	170	523.5	1300	40

¹ Includes both on-site and off-site sources. High First-High (H1H) modeled impact.

Table 7.2-2. Class II Area PSD Increment Modeling Results

Pollutant	Averaging Period	Maximum Modeled Impacts ¹ (µg/m ³)	PSD Increment (µg/m ³)	% of Increment
SO ₂	Annual	4.9	20	25
	24-hour	32.1	91	35
	3-hour	89.1	512	17

¹ Includes both on-site and off-site sources. High First-High (H1H) modeled impact.

7.3 Class I Area Impacts

The two closest Class I areas to the proposed Wilbara plant site are the Swanquarter National Wildlife Refuge (Hyde County, North Carolina) and the Cape Romain National Wildlife Refuge (Awendaw, South Carolina). Swanquarter is located 180 km northeast of the proposed site. Cape Romain is 190 km south of the proposed site.

NC DAQ did require a Class I SIL analysis for SO₂, NO_x, and PM-10. The Applicant used the CALPUFF model with the 4 km, VISTAS-produced, 3-year meteorology dataset and used Class I coordinates provided by the National Park Service to locate receptors. The model showed that Class I impacts of all three pollutants were less than the SILs. Table 7.3-1 provides a summary of the Class I SIL analysis.

Table 7.3-1. Class II Area Preliminary Impact Analysis (SILs)

Pollutant	Averaging Period	Maximum Modeled Impacts ($\mu\text{g}/\text{m}^3$)		Class I Area SILs ($\mu\text{g}/\text{m}^3$)
		Cape Romain	Swanquarter	
SO ₂	3-hour	0.062	0.081	1
	24-hour	0.02	0.03	0.2
	Annual	0.012	0.018	0.08
NO _x	Annual	9.53E-06	7.45E-06	0.1
PM-10	24-hour	5.70E-03	6.92E-03	0.32
	Annual	2.75E-04	4.27E-04	0.16

Based on the Class I SIL analysis results summarized above, a full Class I increment analysis is not required for the proposed sulfuric acid plant.

7.4 North Carolina Air Toxics Analysis

Wilbara modeled the ambient impacts of H₂SO₄ mist from the proposed sulfuric acid plant to demonstrate compliance with the Acceptable Ambient Levels (AALs) in accordance with the NC toxic air pollutant regulations pursuant to 15A NCAC 2D .1100. Table 7.3-1 shows the highest modeled ambient impact for H₂SO₄ mist. The highest impact occurred on the property fenceline. As shown in the table, the H₂SO₄ mist from the proposed sulfuric acid plant is not expected to exceed the associated AAL.

Table 7.3-1. NC Toxic Air Pollutant Modeling Results

Pollutant	Averaging Period	Maximum Modeled Impacts ($\mu\text{g}/\text{m}^3$)	AAL ($\mu\text{g}/\text{m}^3$)	% of AAL
H ₂ SO ₄	1-hr	1.1	100	1
	24-hr	0.4	12	3

8. ADDITIONAL IMPACT ANALYSIS

8.1 Visibility, Soils, and Vegetation

PSD regulations [40 CFR 61.166(o)(1)] require that applications include an analysis of the impairment to visibility, soils, and vegetation that would occur as a result of the proposed project and the associated commercial, residential, industrial, and other growth. The analysis need not include an evaluation of the impact on vegetation having no significant commercial or recreational value.

The proposed sulfuric acid plant will be located in the Coastal Plains of North Carolina. The local geography is characterized by flat terrain with a mix of forestland (predominated by pine), agricultural crops, and herbaceous vegetation.

A Level 1 visibility impairment analysis was performed using the VISCREEN model to demonstrate that screening criteria will not be exceeded in any Class II Areas. With background visibility set at 80 km, the model showed that screening visibility parameters were exceeded out to a distance of 95 km. There are no special visibility protection areas within a 95 km radius of the facility. Therefore, based on the results of this conservative screening analysis, no significant impacts to local visibility are expected to result from the proposed sulfuric acid plant. (See Section 8.3 for a review of Class I visibility impacts.)

Secondary NAAQS for SO₂ was established at 1,300 µg/m³ (500 ppb) on a 3-hour average to protect the public welfare from any known or anticipated adverse effects, including impacts to soil and crops. Air dispersion modeling, summarized in Section 7 of this Preliminary Determination, predicts the 3-hour average SO₂ impact to be 523.5 µg/m³, or about 40% of the secondary NAAQS. The modeled impact includes both background concentration and off-site impacts. The highest modeled impacts occur at or near the proposed facility fenceline. No significant impacts to local soils or vegetation are expected to result from the proposed sulfuric acid plant.

8.2 Growth Impacts

PSD regulations [40 CFR 61.166(o)(2)] requires that applications include an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the proposed modification.

Wilbara expects a total employment of approximately 25 people at the proposed sulfuric acid plant. Growth impacts and secondary emissions resulting from the proposed project are expected to be minimal.

8.3 Class I Areas – Air Quality Related Values (AQRVs)

PSD regulations [40 CFR 61.166(p)] provides an opportunity for the Federal Land Manager (FLM) to determine whether the proposed modification would have an adverse impact on an air quality related value (AQRV), including visibility, on any Class I areas.

The two closest Class I areas to the proposed Wilbara plant site are the Swanquarter National Wildlife Refuge (Hyde County, North Carolina) and the Cape Romain National Wildlife Refuge (Awendaw, South Carolina). Swanquarter is located 180 km northeast of the proposed site. Cape Romain is 190 km south of the proposed site. The U.S. Fish and Wildlife Service (FWS) indicated that, based on projected emissions and distances from both Swanquarter and Cape Romain, negligible effects on AQRVs are expected and no Class I visibility or deposition modeling is required.⁶

⁶ BOND, M., (Meredith_Bond@fws.gov) 2007. RE: CLASS I Coord for PSD Project in NC. 28 December. Email to: Jerry Freeman (Jerry.L.Freeman@ncmail.net).

APPENDIX A
DRAFT PERMIT

APPENDIX B
PUBLIC NOTICE